

(19)

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 349 746 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

03.08.2005 Bulletin 2005/31

(51) Int Cl.7: **B60N 2/56**

(21) Application number: 01992237.6

(86) International application number:
PCT/US2001/049640

(22) Date of filing: 27.12.2001

(87) International publication number:
WO 2002/053411 (11.07.2002 Gazette 2002/28)

(54) VENTILATED SEAT FOR A VEHICLE

BELÜFTETER FAHRZEUGSITZ

SIEGE VENTILE

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR

• LUMBARD, Mary, J.

Dexter, MI 48130 (US)

• LISS, Anne, P.

Livonia, MI 48150 (US)

• REED, William, G.

Walled Lake, MI 48390 (US)

(30) Priority: 05.01.2001 US 755505

(74) Representative: Dealtry, Brian

Eric Potter Clarkson,

Park View House,

58 The Ropewalk

Nottingham NG1 5DD (GB)

(43) Date of publication of application:

08.10.2003 Bulletin 2003/41

(73) Proprietor: Johnson Controls Technology

Company

Holland Michigan 49423 (US)

(72) Inventors:

• WHITE, Brennan, L.
Commerce, MI 48390 (US)

(56) References cited:

DE-A- 3 705 756

DE-A- 19 736 951

FR-A- 1 266 925

FR-A- 2 630 056

EP 1 349 746 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**BACKGROUND OF THE INVENTION****FIELD OF THE INVENTION.**

[0001] The present invention relates generally to the art of vehicle seating and more particularly to ventilated seating wherein air may be forced upwardly from the seating surface or draw downwardly therethrough to enhance occupant comfort. More specifically, the present invention relates to a ventilated seating system which is easy to install into a seat in a single operation and which is easy to adapt to a wide variety of seating designs.

DESCRIPTION OF THE PRIOR ART.

[0002] Many different types of ventilated seats are known to the art. They typically are designed to enhance occupant comfort by passing air through the covering of the seat or horizontal through the seat itself. In warm weather the air flow moves in the vicinity of the seat contacted by the occupant's body and assists in cooling and reducing sweating. In cold weather, ventilated seats can help warm the occupant if heated air is forced through the seat or the seat covering. It is known therefore, that air flow in ventilated seats can be in either direction.

[0003] It is also known that the air used in ventilated seats can be ambient air (i.e., air of the same temperature as the vehicle interior) or cooled or heated air. For example, a ventilated seat can be coupled to a vehicle's air conditioning system. In addition, known ventilated seating can include flow control to increase or decrease total air flow, as well as direction, such as by having low, medium and high flow settings.

[0004] Ventilated vehicle seating, while being known for some time, is not widely used in the industry and is usually an expensive option or standard equipment in luxury priced vehicles. One reason is cost of manufacture, and as noted in many of the patents provided with this application, ventilated seating systems can be complex in design and difficult to install. In many cases providing a ventilation feature becomes a dominant consideration in overall seat design and may force the seat manufacturer to compromise comfort or styling details. In most cases the ventilation components must be carefully located within the seat, and the duct work and air moving apparatus must be accounted for before the final layer of seat cushioning and trim is sewn to the other components. Increased time in assembly equates to increased cost for the manufacturer, the OEM and the ultimate customer. A ventilated seating system which works effectively and provides even air flow at the portions of the seat to be ventilated, and which is less costly to manufacture than prior art ventilated seats, would represent a substantial advance in this art.

[0005] FR 2 630 056 discloses a ventilated seat for placement in the passenger compartment of a vehicle.

The seat includes a cushion and a backrest, the cushion and the backrest each having an air-permeable trim element and an air-permeable external covering. A motorized fan unit takes air from the passenger compartment and blows the air into the trim element under the covering of the cushion and the backrest. The trim element includes a pouch arranged in contact with elements for supporting the seat cushion and the backrest respectively. The upper face of the pouch includes perforations to diffuse air, and includes a cross-linked foam having channels into which air is blown from a diffuser associated with the fan.

FEATURES AND SUMMARY OF THE INVENTION

[0006] According to an aspect of the invention there is provided a vehicle seat of the type disclosed in FR-A-2 630 056 and as claimed in Claim 1.

[0007] A primary feature of the present invention is to provide a ventilated seating system which overcomes the above-noted disadvantages of prior art ventilated seats.

[0008] Another feature of the present invention is to provide a ventilated seating system which is relatively inexpensive and which can be easily adapted to a variety of seat designs.

[0009] A different feature of the present invention is to provide a ventilated seating system which produces a substantially uniform air flow in all of the areas of the seat where ventilation is desired.

[0010] Yet another feature of the present invention is to provide a ventilated seating system which may include a heating layer to enhance occupant comfort during cold weather.

[0011] Another feature of the present invention is to provide a ventilated seating system, the performance of which is not impaired by heavy occupants.

[0012] How these and other features of the invention are accomplished, individually or in various combinations, will be described in the following detailed description of the preferred embodiment, taken in conjunction with the drawings. Generally, however, the features are provided in a ventilated seating system which is located beneath the trim (for example, perforated leather, cloth, etc.) and is installed at the plant of the seat manufacturer. The ventilated seating system includes a bag having upper and lower sheets of non-permeable material which prevent the passage of air except at locations determined by the manufacturer. Within the bag is a three dimensional, expanded spacer material, preferably one which includes upper and lower layers of netting and fibers located therebetween which are stiff and which extend between the upper and lower netting layers. Expanded plastics can also be used. The spacer material is sufficiently stiff to avoid blockage of air flow when the seat is occupied, even by heavy occupants. Holes are provided in the upper surface of the bag, and preferably the holes are provided in a pattern matching the contact

area of the occupant. For example, the bag for a seat cushion may include holes arranged in a U-shape, while a seat back might include a linear array of holes extending from the lower part of the seat to the upper part. An air movement system (e.g., a fan or a duct coupled to the vehicle's air conditioning system) is coupled to the bag and hence to the air space created by the spacer material to cause air movement laterally, longitudinally and vertically through the spacer material. If the air movement system is in a suction mode, air is drawn through the holes, into the spacer material and out of the bag. In a pressurization mode, air is forced into the bag and outwardly through the holes. The features of the present invention are also accomplished by altering the hole sizes so that holes nearer the air flow entrance or exit are smaller, thereby equalizing the amount of air which passes through the holes. An optional heater pad may be employed as a layer between the seat trim layer and the upper layer of the bag, or heating may be accomplished by coupling the air mover to the vehicle forced air heating system. For cooling, ambient air may be used, or the fan may be coupled to the vehicle's air conditioning system. Other ways in which the features of the present invention are accomplished will become apparent to those skilled in the art after they have read the following detailed description of the preferred and alternate embodiments, such other ways also being deemed by the present inventors to be within the scope of the present invention if they fall within the scope of the claims which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In the following drawings like reference numerals are used to indicate like components.

[0014] FIGURE 1 is a perspective, schematic view, with portions broken away, showing the main components of the ventilated seating system according to the preferred embodiment of the present invention;

[0015] FIGURE 2 is a perspective, schematic view of the ventilated seating system of the present invention (with the upper trim and the optional heating layer removed) showing the placement of two ventilated seating bags on the cushion and seatback and illustrating the coupling thereof to a single fan; and

[0016] FIGURE 3 is an exploded view of the major components of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED AND ALTERNATE EMBODIMENTS

[0017] Before beginning the detailed description of the preferred and alternate embodiments, several general comments can be made about the applicability and the scope of the present invention.

[0018] First, the ventilated heating system of this invention can be used with a wide variety of seats, including the sport or bucket type seat illustrated in FIGURE

2 or in bench seating. For the latter, the ventilation system may be occupant selective, i.e., may have separate controls for different portions of the same seat, or may have a single bag system with one control.

5 [0019] Second, the ventilated heating system of this invention is shown with an air-permeable optional heating pad over the upper layer of the bag and beneath the trim of the seat. Other ways of seat heating may be employed, such as coupling the air space within the bag to the vehicle's air heating system.

10 [0020] Third, it is preferable that the ventilated seating system of the present invention be sewn along with seat trim and cushioning components to enhance manufacturing efficiency. However, the bag may be assembled 15 as a separate component and then placed in the seat and coupled to the fan as a separate unit. In this regard, it should be noted that cushioning and other comfort layers which are not illustrated or described in detail in the specification may be used. If cushion layers are placed 20 over the top of the bag, they should be open pore to permit air to readily pass through them.

25 [0021] Fourth, the way in which the fan illustrated in the drawings is coupled to sources of cooled, heated or ambient air is not shown in detail, but if it is desired to couple the fan to either the air cooling system of the vehicle or to the vehicle's air heating system, conventional duct work used in the vehicle manufacturing field may be employed to convey temperature modified air from the source to the fan.

30 [0022] Fifth, with the exception of the spacer material, which is located within the air-impermeable bag, the materials used for constructing the trim, heater pad and the bag itself may be selected from a wide range of materials. For the trim, air-permeable materials should be selected, such as cloth or perforated leather, but the thickness, color, etc., may be widely varied. Other spacer 35 materials, such as expanded plastics, can be employed within the air-impermeable bag, so long as air flow is permitted to occur in any direction, i.e., longitudinally, laterally, or vertically within the spacer material itself.

40 The preferred spacer material to be used herein is a series 5900 spacer material manufactured by Mueller Textile of Wiehl, Germany. This material, in addition to providing air distribution benefits, also provides comfort benefits and includes an upper netting layer, a lower netting layer and a plurality of stiffened resin fibers extending between the netting layers. It may deform slightly when an occupant sits on the seat, but the material is sufficiently resilient that it will not be crushed to the point

45 when the air flow is blocked, thereby impairing the effectiveness of the seat ventilation. In the preferred embodiment, the upper layer of the bag is made of a dual layer material having a first lower layer consisting of an air-impermeable resin film, over which is placed a thin foam layer. A suitable material is Pladilon™ material, manufactured by Foamex International, Inc., of Southfield, Michigan, U.S.A.

55 [0023] Proceeding now to a description of the pre-

ferred embodiment, FIGURE 1 shows in schematic form with portions cut away, a ventilated seat assembly 10 according to the preferred embodiment of the present invention. Assembly 10 includes a number of different layers which, in various aspects of the invention can be varied and/or eliminated as mentioned above. The upper layer of seat assembly 10 is the perforated trim which preferably is cloth or perforated leather. Located beneath the trim 12 is an air-permeable heater layer 14. Located beneath heater layer 14 is the top layer 16 of a bag 18. The bottom 20 of bag 18 is also shown in this Figure, as is the joining of the top 16 and bottom 20 to form an air-impermeable bag, except for a plurality of holes 22 formed in the bag top 16. It can be noted in FIGURE 1 that a hole can be formed in the heater pad 14, but if the heater pad material is air permeable, it is not necessary to do so. It will also be noted in FIGURE 1 that the size of the holes 22 located near the lower portion of the FIGURE are larger than holes nearer the heater pad 14. More will be said in this regard later.

[0024] The final component of assembly 10, as shown in FIGURE 1, is a spacer material 24. As indicated earlier, the preferred spacer material is the Mueller Textile material which includes an upper netting layer, a lower netting layer and a plurality of fibers extending between them. This material has sufficient resiliency to prevent crushing of spacer layer 24 when an occupant sits on or leans back against a ventilated seat assembly 10.

[0025] FIGURE 2 illustrates the use of two bags attached to a seat 30 comprised of a seatback 32 and a seat cushion 34. One bag 10 resides along the center area of the seatback 32, while another bag is located at the center portion of the cushion 34. The bags each extend through the bite line of the seat and the bag impermeable layers are suitably coupled to a fan 35 located below the bite line.

[0026] FIGURE 2 also illustrates in greater detail the aspect of the preferred embodiment of the present invention which varies the size of the holes 22 as the distance from the air mover increases. In this Figure, three openings are provided in the bag extending up the backrest 32 with holes 37, 38 and 39 becoming gradually larger as the distance from fan 35 increases. A linear pattern is provided for these holes, as that pattern has been found to be acceptable for the heating or cooling of an occupant. The bag located on the cushion 34 also includes a pattern of openings 22, this time the openings being provided in a U-shape to rest under the legs and seat of the occupant. The opening 42 at the bottom of the "U" is the smallest and sets of openings 43, 44, 45, and 46 extend in a spaced relationship toward the front of the bag and grow gradually larger. This size and arrangement of the air holes, with the smaller holes being near the air mover, contribute to a more uniform flow of air from the air mover, in this case fan 35.

[0027] Proceeding next to FIGURE 3, a more detailed, exploded view of a single bag is shown. The same reference numerals will be used as were used in con-

nection with FIGURE 1 for the various layers. Proceeding from the top, the perforated trim layer 12 is shown above the heater layer 14 (and in this case, the electrical coupling through wires 15 is shown). The bag top 16 is located beneath the heater and the spacer material 24 is then provided. Bottom 20 of the bag completes the assembly on a seat cushion 48.

[0028] In FIGURE 3, each of the bag top 16, spacer 24 and bag bottom 20 include elongate tails marked with the same reference number with a prime sign (e.g. 16'). In the illustrated embodiment, these extend through the seat bite line and an opening 49 is provided in the material forming the bag top 16. In this Figure, a fan 50 acts as the air mover and is coupled to opening 49. Depending on the seat style and location, the tail may extend forwardly or to the side.

[0029] In use, the system illustrated in FIGURE 3 is preferably sewn to the seat at the same time trim 12 is attached. Components 12, 14, 16 and 20 can be sewn together, the sewing of the latter two forming a portion of the seal extending about bag 18. Components 16' and 20' would be sewn along their edges to maintain the air-impermeability in that area. The attachment of the fan itself could be made in any suitable manner, such as by using an adhesive or the like. It is also easy to understand by reference to FIGURE 3 how other air moving systems could be employed for the ventilated seat of the present invention. For example, a duct extending from the vehicle's air conditioning system could have its end coupled in a sealed relationship to opening 49 to allow heated or cooled air to pass along the spacer to the holes (not shown in this Figure) and the bag top 16. It can also be mentioned again here that the speed and direction of air movement can be controlled by a separate controller coupled to the air mover 50 or by using the fan speed and temperature controls of the vehicle. If a fan 50 is used which is not directly coupled to the vehicle's air conditioning system, it is preferred that the fan be reversible to operate in a pressurizing or suction mode and that the fan be multispeed, i.e., having at least low, medium and high settings.

[0030] While the present invention has been described in connection with single preferred and then the alternate embodiment, the present invention is not to be limited thereby but is to be limited solely by the scope of the claims which follow.

Claims

1. A ventilated seat for a vehicle comprising:

a vehicle seat (30) having a seat cushion component (34; 48) and a seat backrest component (32), at least one of which is ventilated, each ventilated component having an air-permeable trim surface (12) at the occupant contact areas of the seat (30);

- a bag (18) formed of air-impermeable material located beneath the trim surface (12) of each ventilated component, the bag (18) including a top (16) and a bottom (20), the top (16) being nearer the trim surface (12), holes (22) formed in the bag top (16) to permit air flow therethrough;
- 5 a spacer (24) located within the bag (18) permitting air to flow in any direction through the spacer (24), the spacer (24) being sufficiently resilient to prevent blockage of air flow when it is compressed by an occupant sitting in the seat (30);
- 10 a bag opening (49); and
- an air mover coupled to the bag opening;
- 15 **characterised in that** some bag holes (22) are located nearer the bag opening than other holes (22) and the size of the holes (22) increases as the distance from the bag opening (49) increases.
- 20
2. The ventilated seat of claim 1, wherein the spacer (24) comprises an upper netting layer adjacent the bag top (16), a lower netting layer adjacent the bag bottom (20) and a plurality of plastic fibers extending between the upper netting layer and the lower netting layer.
- 25
3. The ventilated seat of claim 1, wherein the bag top (16) includes an inner resin air-impermeable film layer and an outer covering of foam.
- 30
4. The ventilated seat of claim 1, wherein the air mover is a fan (35; 50) coupled to the bag opening (49).
- 35
5. The ventilated seat of claim 1, wherein the air mover is the vehicle's air conditioning system.
- 40
6. The ventilated seat of claim 1 comprising an electrically powered heater layer (14) between the bag top (16) and the trim surface (12).
- 45
7. The ventilated seat of claim 1 wherein the bag holes (22) are arranged in a pattern generally corresponding to the contact area an occupant would have with the seat (30).
- 50
8. The ventilated seat of claim 1, wherein both the seat cushion component (34) and the seat backrest component (32) are ventilated.
- 55
9. The ventilated seat of claim 8, wherein a single air mover is coupled to the two bags (18), the air mover being coupled to an extension of each bag (18).
10. The ventilated seat of claim 8, wherein both bag tops (16) are made from an inner film resin layer and an outer covering of foam.
- 5
11. The ventilated seat of claim 1, wherein the air mover is adapted to force air into the bag (18) and outwardly through the holes (22) and is a variable speed air mover.
12. The ventilated seat of claim 1, wherein the air mover is adapted to suction air from the bag (18) and inwardly through the holes (22) and is a variable speed air mover.
13. The ventilated seat of claim 1, wherein the air mover is reversible and adapted to selectively draw air from or force air into the bag (18).
14. The ventilated seat according to any preceding claim, wherein the seat cushion component (34, 48) includes a generally horizontal cushion and the air-permeable trim surface (12) includes an air-permeable decorative exterior trim cover, and wherein the holes (22) are arranged and sized to provide a generally uniform air movement through the holes (22).
15. The ventilated seat according to any preceding claim, wherein the seat cushion component (34, 48) and the seat backrest component (32) are ventilated and a bite line is formed therebetween; and wherein a portion of each bag (18) and spacer (24) extends through the bite line between the seat cushion component (34, 48) and the seat backrest component (32); and the bag opening is located in the portion of the bag (18) extending through the bite line.
- 35
- Patentansprüche**
1. Belüfteter Sitz für ein Fahrzeug, umfassend:
- 40 einen Fahrzeugsitz (30) mit einer Sitzpolsterkomponente (34; 48) und einer Rückenlehnenkomponente (32), von denen wenigstens eine belüftet ist, wobei jede belüftete Komponente eine luftdurchlässige Bezugs Oberfläche (12) an den Benutzerkontaktflächen des Sitzes (30) aufweist;
- 45
- 50 eine Hülle (18) aus einem luftundurchlässigen Material, die unter der Bezugs Oberfläche (12) jeder belüfteten Komponente angeordnet ist, wobei die Hülle (18) eine Oberseite (16) und eine Unterseite (20) enthält, wobei die Oberseite (16) sich näher an der Bezugs Oberfläche (12) befindet, wobei Löcher (22) in der Hülleneroberseite (16) ausgebildet sind, damit Luft durch sie hindurch strömen kann;
- 55
- ein Distanzstück (24), das sich im Inneren der Hülle (18) befindet und es gestattet, dass Luft

- in jeder Richtung durch das Distanzstück (24) strömen kann, wobei das Distanzstück (24) genügend Elastizität besitzt, um ein Blockieren der Luftströmung zu verhindern, wenn es durch einen Benutzer, der auf dem Sitz (30) Platz nimmt, zusammengedrückt wird; 5
- eine Hüllenöffnung (49); und
- eine Luftbewegungsvorrichtung, der mit der Hüllenöffnung verbunden ist; 10
- dadurch gekennzeichnet, dass** sich einige Hüllenlöcher (22) näher an der Hüllenöffnung (49) befinden als andere Löcher (22) und dass die Löcher (22) mit zunehmender Entfernung von der Hüllenöffnung (49) größer werden.
2. Belüfteter Sitz nach Anspruch 1, wobei das Distanzstück (24) eine obere Netzsicht neben der Hüllenoberseite (16), eine untere Netzsicht heben der Hüllenunterseite (20) und mehrere Kunststofffasern, die sich zwischen der oberen Netzsicht und der unteren Netzsicht erstrecken, umfasst. 15
3. Belüfteter Sitz nach Anspruch 1, wobei die Hüllenoberseite (16) eine innere luftundurchlässige Harzfilmschicht und einen äußeren Schaumstoffüberzug enthält.
4. Belüfteter Sitz nach Anspruch 1, wobei die Luftbewegungsvorrichtung ein Gebläse (35; 50) ist, das mit der Hüllenöffnung (49) verbunden ist. 20
5. Belüfteter Sitz nach Anspruch 1, wobei die Luftbewegungsvorrichtung die Klimaanlage des Fahrzeugs ist.
6. Belüfteter Sitz nach Anspruch 1, umfassend eine elektrisch betriebene Heizschicht (14) zwischen der Hüllenoberseite (16) und der Bezugsüberfläche (12). 25
7. Belüfteter Sitz nach Anspruch 1, wobei die Hüllenlöcher (22) in einem Muster angeordnet sind, das im Allgemeinen der Kontaktfläche entspricht, die ein Benutzer auf dem Sitz (30) einnehmen würde. 30
8. Belüfteter Sitz nach Anspruch 1, wobei sowohl die Sitzpolsterkomponente (34) als auch die Rückenlehnenkomponente (32) belüftet sind. 35
9. Belüfteter Sitz nach Anspruch 8, wobei eine einzelne Luftbewegungsvorrichtung mit den beiden Hüllen (18) verbunden ist, wobei die Luftbewegungsvorrichtung mit einer Verlängerung jeder Hülle (18) verbunden ist. 40
10. Belüfteter Sitz nach Anspruch 8, wobei beide Hüllenoberseiten (16) aus einer inneren Harzfilmschicht und einem äußeren Schaumstoffüberzug hergestellt sind. 45
11. Belüfteter Sitz nach Anspruch 1, wobei die Luftbewegungsvorrichtung dafür konfiguriert ist, Luft in die Hülle (18) und durch die Löcher (22) nach außen zu drängen, und wobei die Luftbewegungsvorrichtung eine drehzahlveränderliche Luftbewegungsvorrichtung ist.
12. Belüfteter Sitz nach Anspruch 1, wobei die Luftbewegungsvorrichtung dafür konfiguriert ist, Luft aus der Hülle (18) und durch die Löcher (22) nach innen zu saugen, und wobei die Luftbewegungsvorrichtung eine drehzahlveränderliche Luftbewegungsvorrichtung ist. 50
13. Belüfteter Sitz nach Anspruch 1, wobei die Luftbewegungsvorrichtung in entgegengesetzten Richtungen betrieben werden kann und dafür konfiguriert ist, Luft wahlweise aus der Hülle (18) abzusaugen oder in die Hülle (18) hineinzudrängen.
14. Belüfteter Sitz nach einem der vorangehenden Ansprüche, wobei die Löcher (22) so angeordnet und bemessen sind, dass eine im Allgemeinen gleichmäßige Luftbewegung durch die Löcher (22) stattfindet. 55
15. Belüfteter Sitz nach einem der vorangehenden Ansprüche, wobei die Sitzpolsterkomponente (34; 48) und die Rückenlehnenkomponente (32) belüftet sind und zwischen beiden eine Berührungsline gebildet wird; und wobei ein Abschnitt sowohl der Hülle (18) als auch des Distanzstücks (24) sich durch die Berührungsline zwischen der Sitzpolsterkomponente (34; 48) und der Rückenlehnenkomponente (32) erstreckt; und wobei sich die Hüllenöffnung in dem Abschnitt der Hülle (18) befindet, der sich durch die Berührungsline erstreckt.

Revendications

1. Siège ventilé pour un véhicule, comprenant :
un siège de véhicule (30) ayant un composant de coussin de siège (34 ; 48) et un composant de dossier de siège (32), dont l'un au moins est ventilé, chaque composant ventilé ayant une surface de garniture perméable à l'air (12) au niveau de la zone de contact avec l'occupant du siège (30) ;
une enveloppe (18) composée de matériau im-

perméable à l'air et située sous la surface de la garniture (12) de chaque composant ventilé, l'enveloppe (18) incluant une partie supérieure (16) et une partie inférieure (20), la partie supérieure étant plus proche de la surface de la garniture (12), des orifices (22) étant formés dans la partie supérieure (16) de l'enveloppe afin de permettre à l'air de circuler à travers celle-ci ;

une pièce d'écartement (24) située à l'intérieur de l'enveloppe (18) qui permet à l'air de circuler dans n'importe quelle direction à travers la pièce d'écartement (24), ladite pièce d'écartement (24) étant suffisamment élastique pour empêcher le blocage de la circulation de l'air lorsqu'il est comprimé par un occupant qui s'assoit dans le siège (30) ;

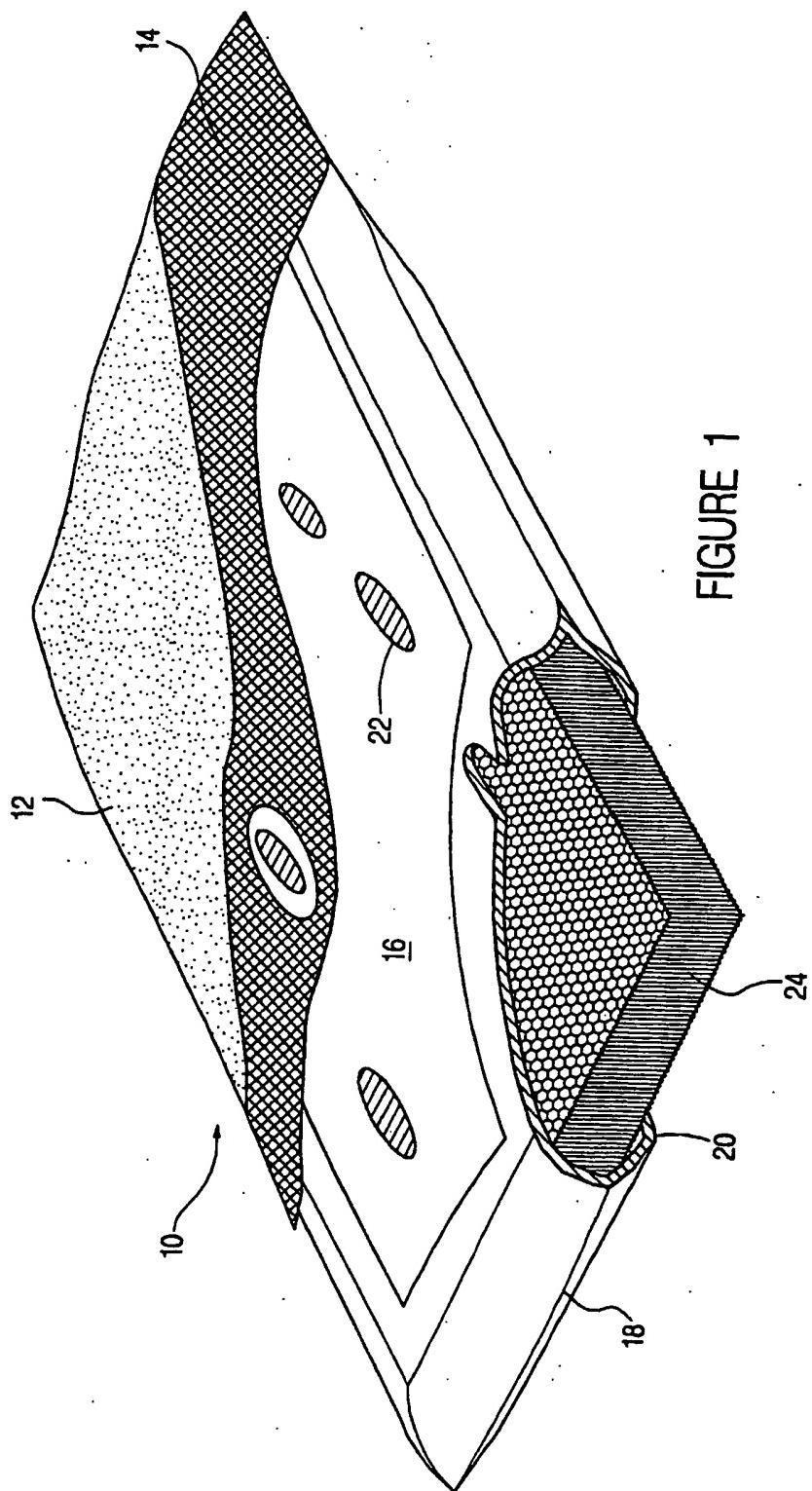
une ouverture de l'enveloppe (49) ; et
un appareil de ventilation relié à l'ouverture de l'enveloppe;

caractérisé en ce que certains orifices (22) de l'enveloppe sont situés plus près de l'ouverture de l'enveloppe que d'autres orifices (22), et **en ce que** la taille des orifices augmente au fur et à mesure que la distance en partant de l'ouverture (49) de l'enveloppe augmente.

2. Siège ventilé selon la revendication 1, dans lequel la pièce d'écartement (24) comprend une couche en filet supérieure adjacente à la partie supérieure (16) de l'enveloppe, une couche en filet inférieure adjacente à la partie inférieure (20) de l'enveloppe, et une pluralité de fibres de plastique qui s'étendent entre la couche en filet supérieure et la couche en filet inférieure.
3. Siège ventilé selon la revendication 1, dans lequel la partie supérieure (16) de l'enveloppe inclut une couche interne de film en résine imperméable à l'air et un revêtement externe en mousse.
4. Siège ventilé selon la revendication 1, dans lequel l'appareil de ventilation est un ventilateur (35 ; 50) relié à l'ouverture (49) de l'enveloppe.
5. Siège ventilé selon la revendication 1, dans lequel l'appareil de ventilation est le système de conditionnement d'air du véhicule.
6. Siège ventilé selon la revendication 1, comprenant une couche chauffante alimenté en courant électrique (14), située entre la partie supérieure (16) de l'enveloppe et la surface de la garniture (12).
7. Siège ventilé selon la revendication 1, dans lequel les orifices (22) de l'enveloppe sont agencés suivant un motif qui correspond de façon générale à la

zone de contact qu'un occupant prendrait sur le siège (30).

8. Siège ventilé selon la revendication 1, dans lequel le composant de coussin de siège (34) et le composant de dossier de siège (32) sont tous deux ventilés.
9. Siège ventilé selon la revendication 1, dans lequel un unique appareil de ventilation est relié aux deux enveloppes (18), l'appareil de ventilation étant relié à une extension de chaque enveloppe (18).
10. Siège ventilé selon la revendication 1, dans lequel les deux parties supérieures (16) de l'enveloppe sont composées d'une couche interne de film en résine, et d'un revêtement externe en mousse.
11. Siège ventilé selon la revendication 1, dans lequel l'appareil de ventilation est conçu pour faire pénétrer de force de l'air dans l'enveloppe (18) et vers l'extérieur, à travers les orifices (22), et est un appareil de ventilation à vitesse variable.
12. Siège ventilé selon la revendication 1, dans lequel l'appareil de ventilation est adapté pour aspirer de l'air dans l'enveloppe (18) et vers l'intérieur, à travers les orifices (22), et est un appareil de ventilation à vitesse variable.
13. Siège ventilé selon la revendication 1, dans lequel l'appareil de ventilation est inversible et conçu pour aspirer de l'air ou pour faire pénétrer de force de l'air dans l'enveloppe (18), de manière sélective.
14. Siège ventilé selon l'une quelconque des revendications précédentes, dans lequel les orifices (22) sont agencés et dimensionnés pour fournir un mouvement d'air généralement uniforme à travers les orifices (22).
15. Siège ventilé selon l'une quelconque des revendications précédentes, dans lequel le composant de coussin de siège (34, 48) et le composant de dossier de siège (32) sont ventilés et une ligne de recouvrement est formée entre les deux ;
et dans lequel une partie de chaque enveloppe (18) et pièce d'écartement (24) s'étend à travers la ligne d'écartement entre le composant de coussin de siège (34, 48) et le composant de dossier de siège (32) ;
et l'ouverture de l'enveloppe est située dans la partie de l'enveloppe (18) qui s'étend à travers la ligne de recouvrement.



BEST AVAILABLE COPY

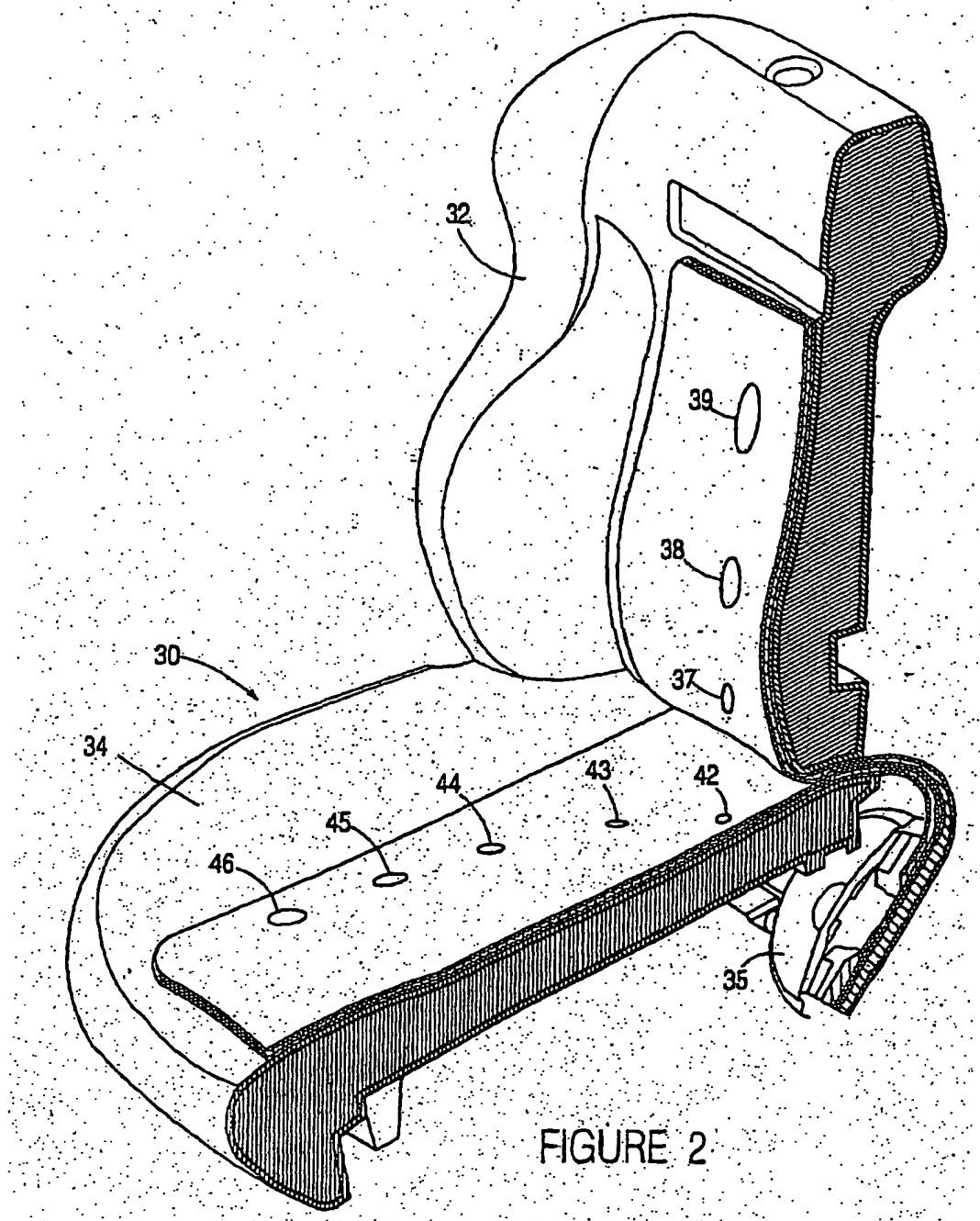


FIGURE 2

BEST AVAILABLE COPY

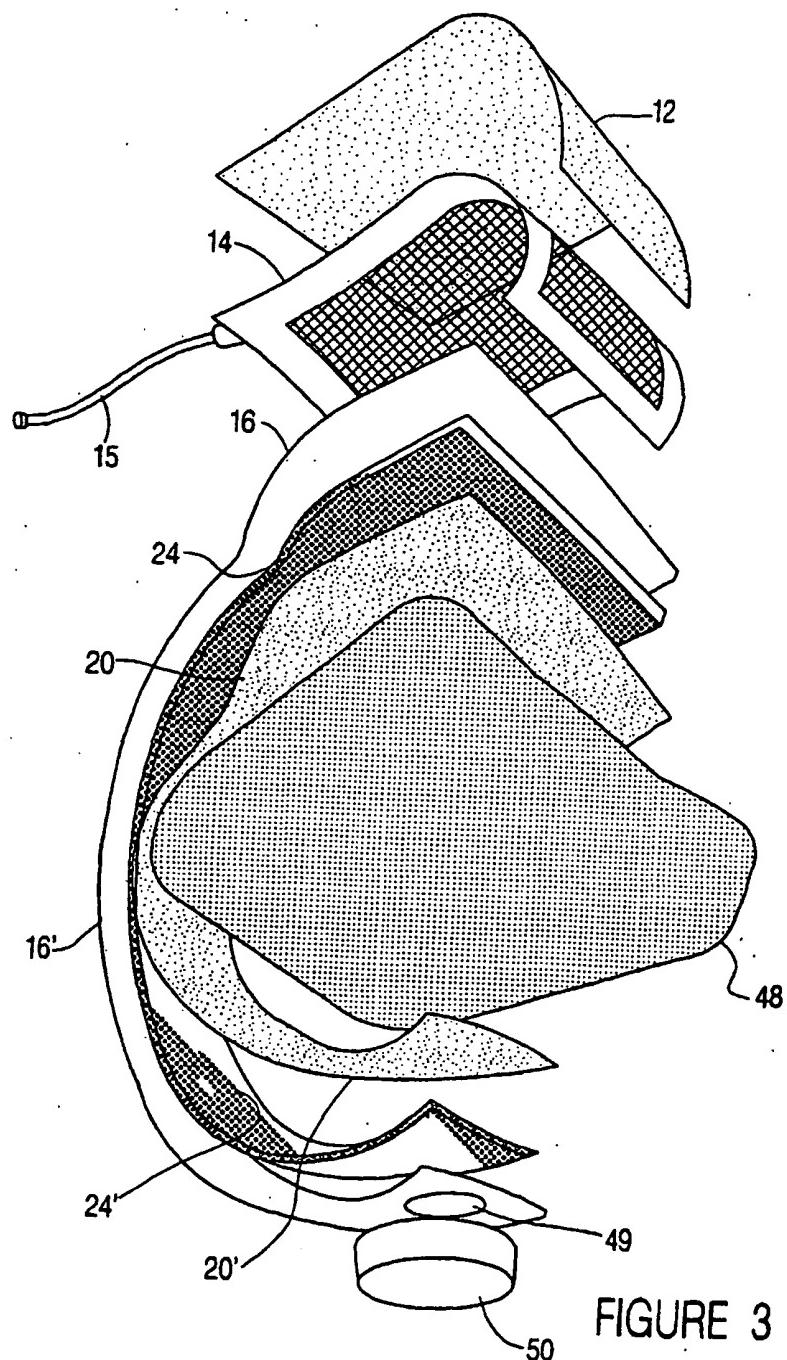


FIGURE 3

BEST AVAILABLE COPY